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BELLCOMM, INC.
955 L'ENFANT PLAZA NORTH, S.W. WASHINGTON, D.C. 20024

SUBJECT: Revisions To The Saturn V Emergency Detection System Case 320

DATE: December 2, 1968

FROM: A. Bresnick

MEMORANDUM FOR FILE

This memorandum summarizes significant changes to the Saturn V Emergency Detection System (EDS) since it was described in Reference 1. Also included is a functional diagram of the EDS as it is implemented for AS-503 (Figure 1). The EDS will be basically the same for all manned Saturn V flights, in accordance with present planning.

The significant EDS changes follow:

(1) (a) The auto abort overrate limits are now:
1. ± 4 degrees/second for pitch or yaw and
2. ± 20 degrees/second for roll.

(b) The manual abort overrate limits during S-II and S-IVB stage flight are now:
1. ± 9.2 degrees/second for pitch or yaw and
2. ± 20 degrees/second for roll.

(c) The three hot wire circuits from the IU to the CSM are now all contained in the main umbilical run which contains other CSM/LV interface wires. This provides a more protected run and less possibility of an inadvertent abort due to wire breakage.

(2) The EDS auto abort capabilities will be switched off by the flight crew at 120 seconds of flight.

(3) Mission rules require that the crew switch off the two engine out auto abort EDS capability in the event of an S-IC engine shutdown after tower clearance.

(4) The "LV RATE" light is used as a redundant cue to the "LV GUID" light for loss of the guidance platform.

(5) The separation of the S-II Aft Interstage is indicated when the "S-II SEP" light goes out. If the light remains illuminated, the interstage has not separated, and this constitutes an abort cue 25 seconds after nominal jettison time.

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(6) The "S-II/S-IVB LV STAGE" switch can be used to (a) upstage from the S-II to the S-IVB during S-II flight, and (b) shutdown the S-IVB during S-IVB flight.

(7) Single failure points in the EDS S-IC engine cutoff circuitry have been removed, and two out of three voting logic has been instituted to avoid the possibility of inadvertent shutdowns.

(8) The S-IVB fuel and oxidizer tank pressure gauges provide an abort cue for excessive common bulkhead differential pressure during earth orbital coast.

A. Bresnick

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A. Bresnick

Attachments
Reference
Figure 1

REFERENCES

1. Embrey, S. G., "Implementation of the Emergency Detection System Design Criteria," Bellcomm, Inc. Memorandum For File, April 21, 1966.

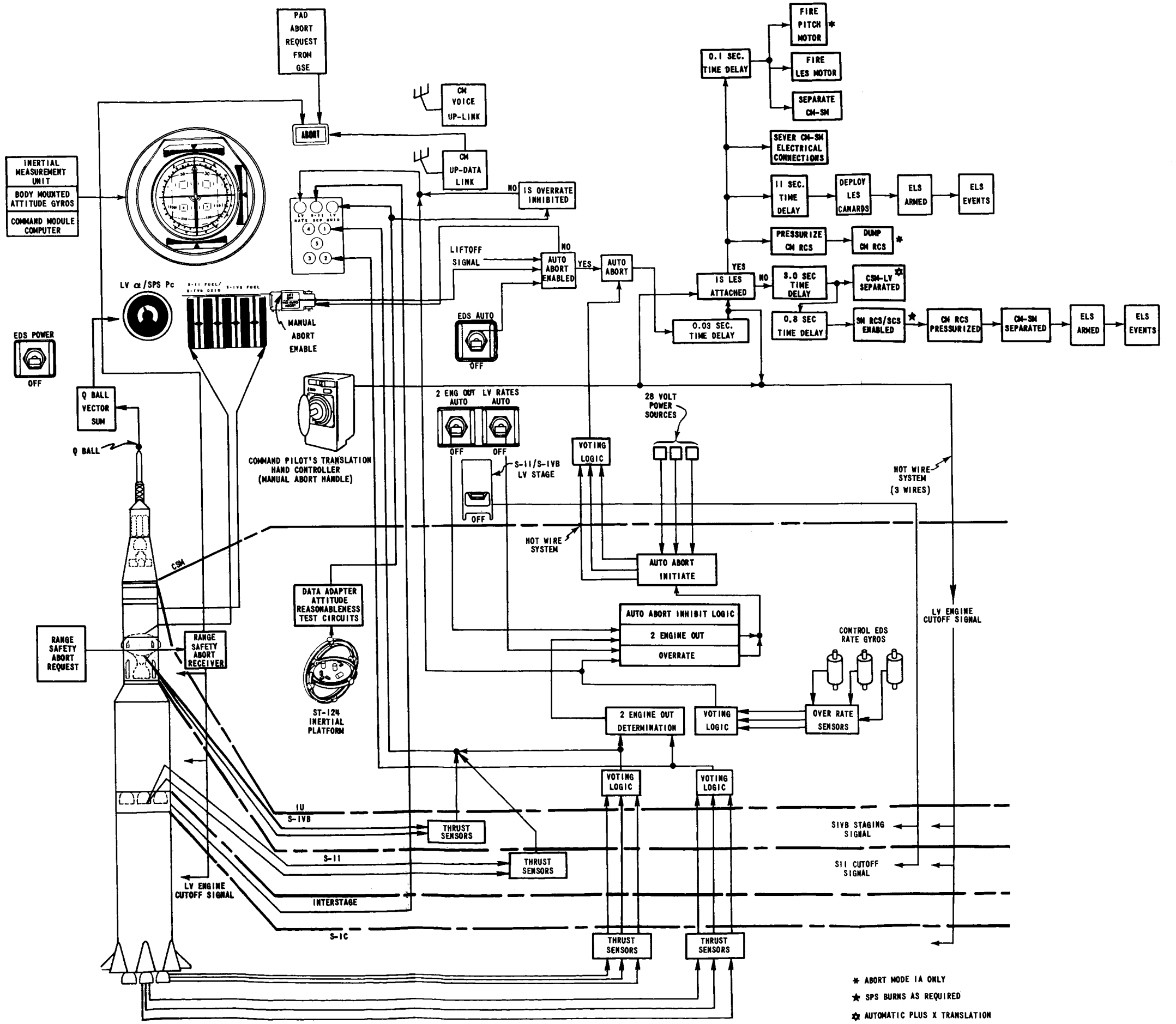

FIGURE 1 - AS-503 EMERGENCY DETECTION SYSTEM

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